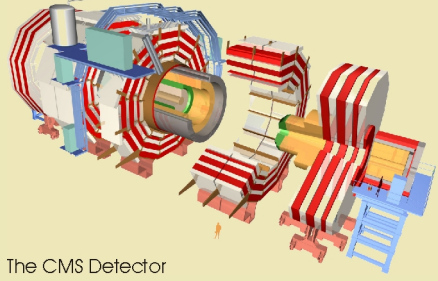


The Challenge

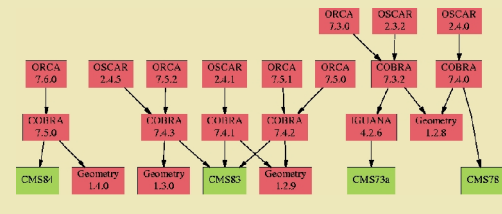
Gigantic Detectors



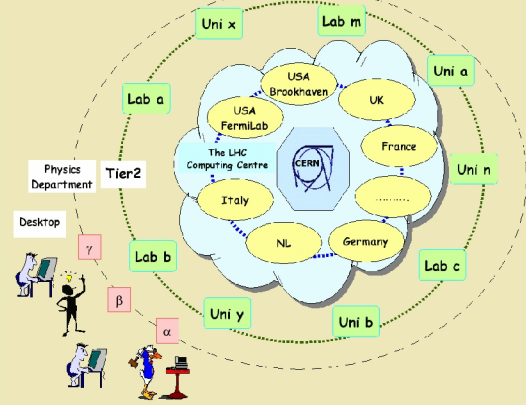
The CMS Detector

- Software distribution requirements:
- Relocatable packages
 - No root privileges necessary
 - Optional network download
 - Command-line installable
 - Saveable and reusable set-up
 - Included validation procedure
 - Concise configuration also for less experienced users
 - Multiplatform support
 - Multiple installations (old/new/pro)

Complex Software



Grid Computing



- CMS Collaboration:
- 36 Countries
 - 160 Institutes
 - 2000 Scientists & Engineers
- CMS data taking:
- Event rate: 100 events/second
 - Event size: 1 MB
 - Events/year: 1 billion
 - Total raw data/year: 1,000,000 GB

- A typical installation of CMS Software:
- 1 GCC compiler package
 - 1 SCRAM package
 - 40 CMS RPM packages
 - 30 LCG RPM packages
- => 72 packages of 1 GB in total
Unpacked: 4 GB of disk space

A Solution: xcmsi

Configuration GUI

Provides complete CMS software environment for development and data analysis

1. Choose software to install:
- Tags: Select set(s) of RPMs resolving dependencies
- Archives: Select single or multiple RPMs

2. Load configuration (optional) / Change configuration (if necessary)

3. Save configuration - Mandatory to transfer configured settings to command-line installer

4. Start, verify or update installation

Command-line Installation



```
GridKa compute nodes

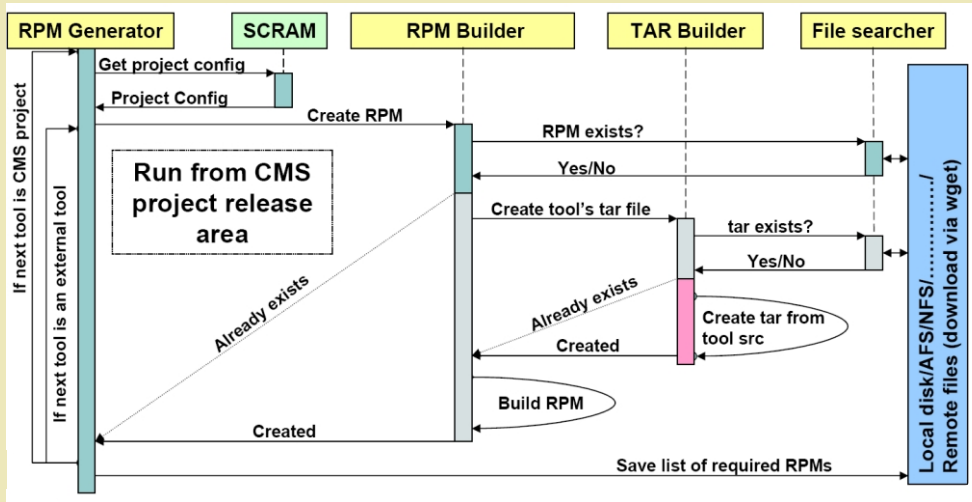
CmsSwGridInstall.pl
-t rpm --site fzk.de
--install "ORCA_8_4_0 OSCAR_3_4_0"
```

Personal notebook



```
cmsi.pl
-f cmsset_default.csh
-d "ORCA_8_4_0 OSCAR_3_4_0"
```

The RPM Generation



RPM generation procedure:

- Start with one parent project based on CMS project release area at CERN
- Check consistency of SCRAM project configuration (skipped for external tools)
- Check whether RPM exists already
- If not, check whether tar file exists for this tool
- If not, create tar file
- Build RPM
- Repeat for all projects/tools on which the parent project depends
- Save list of dependencies for parent project

RPMs successfully tested for:

- RedHat 7.3
- CERN RedHat 7.3
- Fermi Linux 7.3.1
- Mandrake Linux 9.1
- SuSE Linux 8.2, 9.0

An Installation Example



```
cmsSwGridInstall.pl
-t rpm --site fzk.de
--install "ORCA_8_4_0 OSCAR_3_4_0"
```

Default installation path `CMS_PATH: $VO_CMS_SW_DIR/`
`VO_CMS_SW_DIR` is the software installation area for the CMS virtual organisation on grid sites in LCG

Executable (`lca_install_sw.pl`):

- Check on `$VO_CMS_SW_DIR`
- Check disk space
- Check against installed software
- Call `cmsi.pl`
- Copy `cmsset_default.csh` to `$VO_CMS_SW_DIR`
- Publish new software (`lca-ManagedVOTag`)

Grid-specific installation part:

- Find compute element (CE)
- Prepare `tar.gz` archive of `xcmsi`
- Prepare executable to submit
- Submit `jd1` file (`edg-job-submit`)
- Start job monitor to fetch output after completion

Grid monitoring of fzk.de

The following information summarizes the data concerning FZK stored in the GOC database.

SiteName: FZK-LCB2

Contact: loc-admin@itn.fzk.de

Domain: fzk.de

Type	Host	System	Address	Install	Status	Install	Status	Operation	Comment
CE	gridap05	RH7.3adg			LCFing	configured	running		
SE	gridap05								
OC	lca-ftp-w								
LCFG	lcaftp								

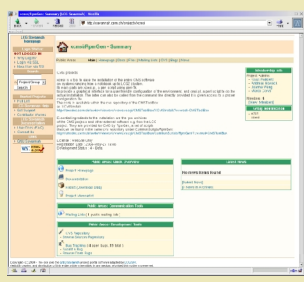
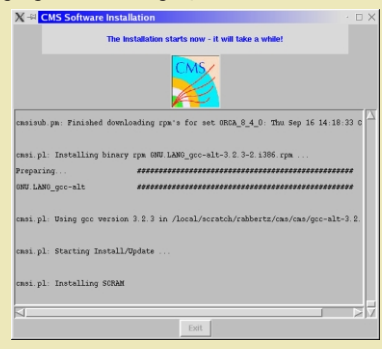


```
cmsi.pl
-f cmsset_default.csh
-d "ORCA_8_4_0 OSCAR_3_4_0"
```

Default installation procedure:

- Parse configuration file `cmsset_default.csh`
- Copy system RPM database (to avoid root privileges)
- Download RPM lists for selected installs from CERN
- Prepare lists of RPMs to be installed
- Check compiler strategy (binary RPM, system compiler, ...)
- Start installation of: GCC compiler, SCRAM, LCG, CMS RPM packages
- Final corrections

Logging window of graphical installation mode



Bug Reporting System
<http://savannah.cern.ch/projects/xcmsi>

and Download Page
<http://cern.ch/cms-xcmsi>

